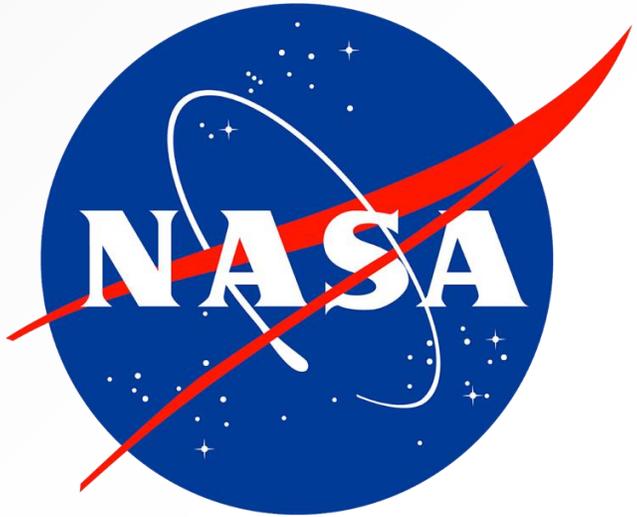




INSPIRE - ENGAGE - EDUCATE - EMPLOY
The Next Generation of Explorers

Minority University Research and Education Project (MUREP)

Torry Johnson, MUREP Manager
NASA Headquarters
June 2021



NASA STEM ENGAGEMENT OVERVIEW

NASA STEM ENGAGEMENT



VISION

We immerse students in NASA's work, enhance STEM literacy, and inspire the next generation to explore.

MISSION

We engage students in NASA's mission

Strategic Goals



Create **unique opportunities** for a diverse set of students to contribute to NASA's work in exploration and discovery.



Build a **diverse future STEM workforce** by engaging students in authentic learning **experiences** with NASA's people, content and facilities.

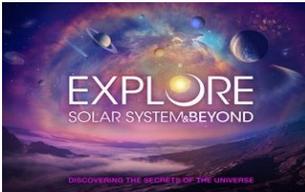


Attract **diverse groups of students to STEM** through learning opportunities that **spark interest** and **provide connections** to NASA's mission and work.

STEM ENGAGEMENT ARCHITECTURE

ENABLING STUDENT OPPORTUNITIES & CONTRIBUTIONS

NASA MISSION DIRECTORATE DRIVERS & REQUIREMENTS



Evidence-based strategies

Rigorous planning



Integrated operational model

STRATEGIC GOALS

Create unique opportunities for students to contribute to NASA's work.

Build a diverse future STEM workforce by engaging students in authentic learning experiences.

Strengthen understanding by enabling powerful connections to NASA's mission and work.

Strategic, balanced portfolio

NASA-unique learning experiences



Student contributions to NASA's work in action

SCALABILITY TO MAGNIFY NASA'S REACH AND IMPACT

K-Elementary School



Middle School



High School



Undergraduate



Graduate



BENEFICIARIES OF NASA'S STEM ENGAGEMENT PORTFOLIO

CONTINUED PROGRESS IN TRANSFORMING STEM ENGAGEMENT



NASA'S MISSION THEMATIC AREAS



NASA STEM ENGAGEMENT PROJECTS

SPACE GRANT

- National network of 52 Consortia with 850 Affiliate members
- Stimulates cooperative programs among universities, industry, federal/state/local governments
- Encourages interdisciplinary education and research programs
- Incorporates State priorities, needs and goals

ESTABLISHED PROGRAM TO STIMULATE COMPETITIVE RESEARCH

- 28 eligible jurisdictions (states and territories)
- Contributes to development of research infrastructure and capabilities
- Fosters partnerships between NASA research entities, industry, and academic institutions
- Incorporates state priorities, needs and goals

MINORITY UNIVERSITY RESEARCH & EDUCATION PROJECT (MUREP)

- Limited to Minority Serving Institutions (MSI)
- Increases retention of underserved and underrepresented groups in STEM
- Enhances infrastructure at MSIs
- Portfolio with 7 funded elements

NEXT GENERATION STEM (NEXTGEN STEM)

- Informal education and K-12 STEM engagement initiatives aligned to mission priorities
- Richer, more comprehensive STEM engagement opportunities
- NASA's Museum Alliance

EDUCATIONAL TOOLS AND PLATFORMS

- Focus: Access and Scalability
- Integrated suite of tools and platforms enabling student access/registration and comprehensive data collection
 - NASA STEM Gateway (Phase 1 operational in early FY2021)
 - STEM.NASA.gov
 - Intern.nasa.gov
 - NASA STEM@Home

PERFORMANCE MEASUREMENT & EVALUATION

- Focus: Outcomes and Metrics
- Learning Agenda
- Targeted Studies

STRATEGIC PARTNERSHIPS

- Focus: Scalability
- Strategic and comprehensive approach to foster and stimulate strategic partnerships
- New partnerships strategy kicked off in FY2020

INTERNSHIPS & FELLOWSHIPS

- Enterprise model in extensive collaboration with Mission Directorates and Centers

ENABLING CROSS-CUTTING FUNCTIONS



STEM ENGAGEMENT BENEFICIARIES

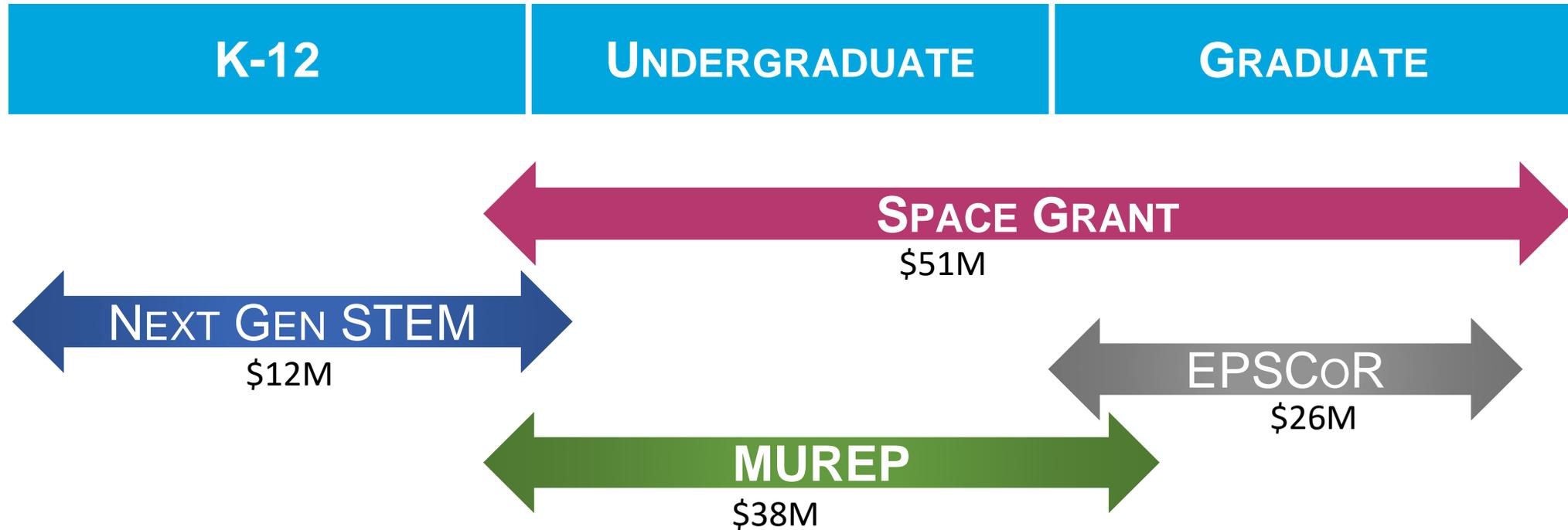


K-Elementary School
Middle School
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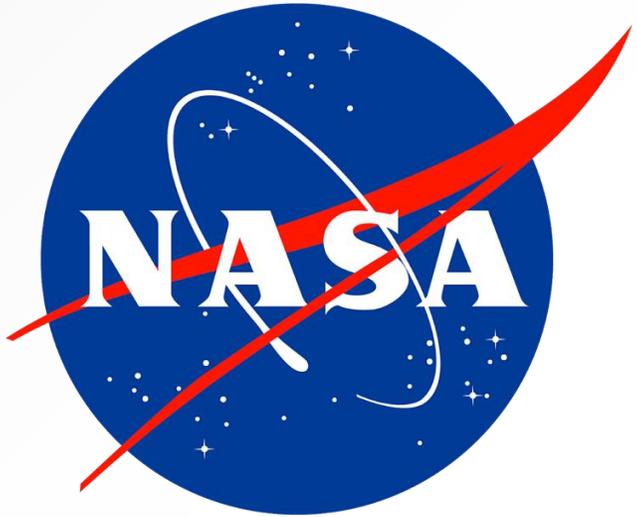
STEM ENGAGEMENT PROGRAM INVESTMENTS (FY21)



BENEFICIARIES



BY FAR MOST OF NASA'S STEM ENGAGEMENT PROGRAM INVESTMENTS ARE APPROPRIATED TOWARDS SERVING HIGHER EDUCATION STUDENTS.



MUREP BACKGROUND AND OBJECTIVES

MINORITY UNIVERSITY RESEARCH AND EDUCATION PROJECT (MUREP)

PURPOSE AND STATUTORY AUTHORITY



AGENCY RESPONSE TO FEDERAL EXECUTIVE ORDERS FOR MINORITY SERVING INSTITUTIONS (MSIs)

MUREP is established to increase NASA's responsiveness to federal mandates related to MSIs and underrepresented and underserved communities, including women, girls, persons with disabilities and veterans.

- EO 13779:** White House Initiative to Promote Excellence and Innovation at Historically Black Colleges and Universities (HBCU)
- EO 13621:** White House Initiative on Educational Excellence for African Americans (PBI)
- EO 13592:** Improving American Indian and Alaska Native Educational Opportunities and Strengthening Tribal Colleges and Universities (TCU/NASNTI)
- EO 13935:** White House Hispanic Prosperity Initiative (HSI)
- EO 13515:** Increasing Participation of Asian Americans and Pacific Islanders in Federal Programs (AANAPISI / ANNH)

DEFINING MINORITY SERVING INSTITUTIONS (MSI)



MSIs are federally recognized institutes of Higher Education in the United States (U.S.) that enroll and serve a significant percentage of minority students. These institutions are eligible to receive federal funding under Title III and V of the Higher Education Act of 1965, as amended by the Higher Education Opportunity Act of 2008. Today, there are more than 700 federally designated MSIs that represent approximately 14 percent of all degree-granting institutions of higher education.

Historically Defined MSIs

Established with the specific purpose of providing access to higher education for specific minority groups

- ❖ Historically Black Colleges and Universities (HBCU)
- ❖ Tribal Colleges and Universities (TCU)

Enrollment Defined MSIs

Designated by the U.S. Department of Education based on minority student enrollment and financial resources

- ❖ Alaska Native-Serving and Native Hawaiian-Serving Institutions (ANNH)
- ❖ Asian American and Native American Pacific Islander-Serving Institutions (AANAPISI)
- ❖ Hispanic-Serving Institutions (HSI)
- ❖ Native American-Serving Nontribal Institutions (NASNTI)
- ❖ Predominantly Black Institutions (PBI)

DEFINING MINORITY SERVING INSTITUTIONS (MSI)



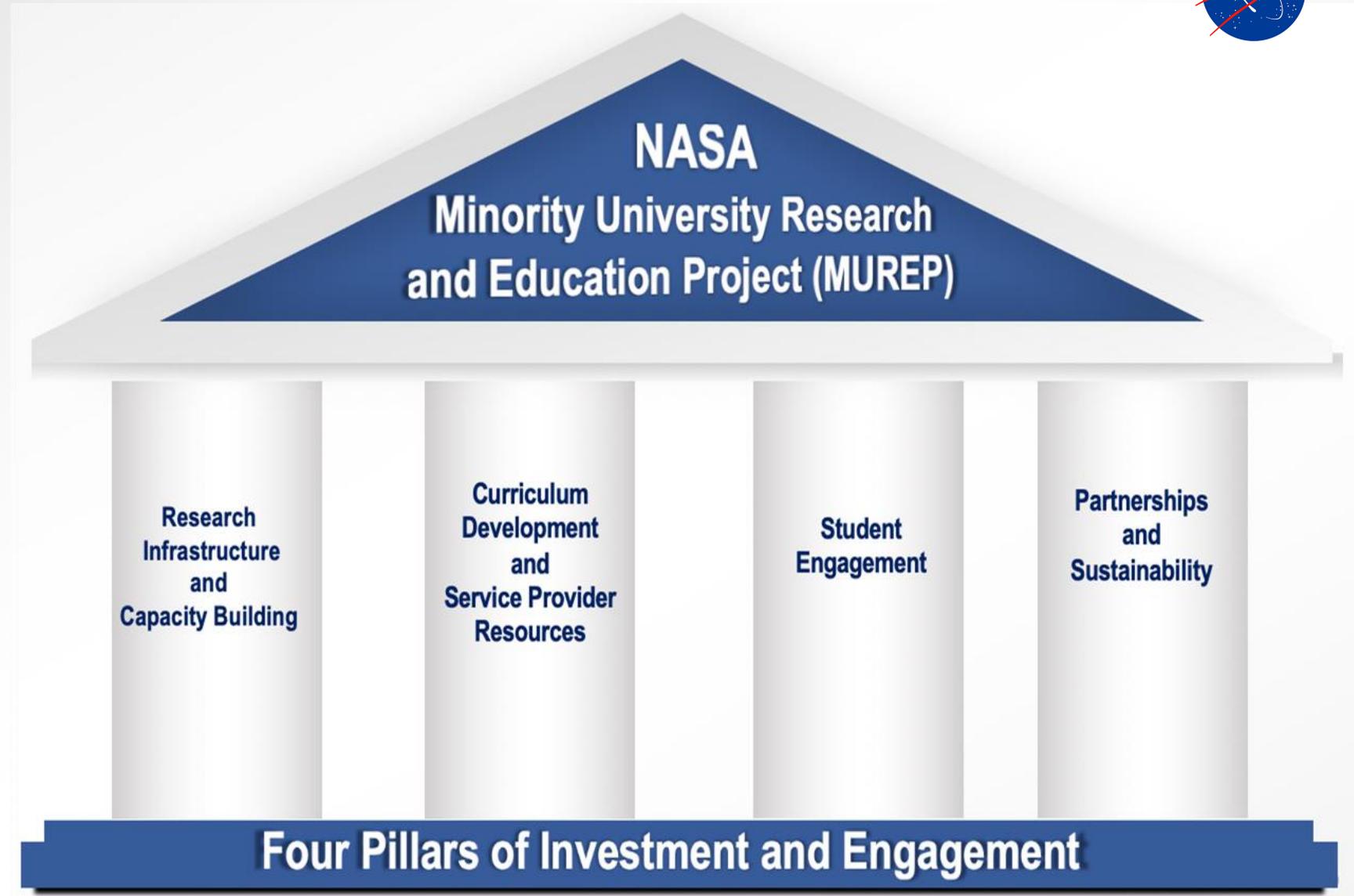
MSI Type	Acronym	Federal Recognition	Executive Order	Definition
Historically Black Colleges and Universities	HBCU	Higher Education Act of 1965	EO 13779 - White House Initiative to Promote Excellence and Innovation at Historically Black Colleges and Universities	Any historically black college or university established prior to 1964, whose principal mission was, and is, the education of Black Americans.
Tribal Colleges and Universities	TCU	Tribally Controlled College or University Assistance Act of 1978	EO 13592 – Improving American Indian and Alaska Native Educational Opportunities and Strengthening Tribal Colleges and Universities	Institutions chartered by their respective Indian tribes through the sovereign authority of the tribes or by the federal government with the specific purpose to provide higher education opportunities to American Indians through programs that are locally and culturally based, holistic, and supportive.
Hispanic-Serving Institutions	HSI	Higher Education Act of 1992	EO 13935 – White House Hispanic Prosperity Initiative	Institutions with 25 percent or more total undergraduate Hispanic full-time equivalent student enrollment.
Alaska Native-Serving and Native Hawaiian-Serving Institutions	ANNH	Higher Education Act of 1998	EO 13515 – Increasing Participation of Asian Americans and Pacific Islanders in Federal Programs	Alaska Native-Serving Institutions are institutions that have at least 20 percent Alaska Native students. Native Hawaiian-Serving Institutions are institutions that have at least 10 percent Native Hawaiian students. These institutions are collectively referred to as ANNH institutions.
Asian American and Native American Pacific Islander-Serving Institutions	AANAPISI	College Cost Reduction and Access Act of 2007	Reference EO 13515	Institutions that have at least 10 percent enrollment of Asian American Pacific Islander students.
Native American-Serving, Nontribal Institutions	NASNTI	Higher Education Opportunity Act of 2008	Reference EO 13592	Institutions that have at least 10 percent enrollment of Native American students.
Predominantly Black Institutions	PBI	Higher Education Opportunity Act of 2008	EO 13621 – White House Initiative on Educational Excellence for African Americans	Institutions that serve at least 1,000 undergraduate students; have at least 50 percent low-income or first-generation to college degree-seeking undergraduate enrollment; have low per-full-time undergraduate expenditure in comparison with other institutions offering similar instruction; and enroll at least 40 percent African American students.

SOURCE: National Academies of Sciences, Engineering, and Medicine. 2019. *Minority Serving Institutions: America's Underutilized Resource for Strengthening the STEM Workforce*. Washington, DC: The National Academies Press. Available at <https://doi.org/10.17226/25257>.



MUREP VISION

To enhance the research, academic and technological capabilities at MSIs by providing authentic student learning experiences related to NASA missions that contribute to a Diverse Future STEM Workforce.





Minority University Research and Education Project (MUREP)

FY 21 – 22 Engagement Portfolio



RESEARCH INFRASTRUCTURE & CAPACITY BUILDING

Mission Driven Research Efforts:

- ❖ MUREP Institutional Research Opportunity (MIRO)
- ❖ MUREP Aerospace High Volume Manufacturing & Supply Chain Management Cooperative (MUREP High Volume) – ARMD
- ❖ MUREP Space Technology Artemis Research (MSTAR) – STMD
- ❖ MUREP Ocean Biology and Biogeochemistry (OCEAN) – SMD



CURRICULUM DEVELOPMENT & SERVICE PROVIDER RESOURCES

Virtual Tools:

MSI Exchange / Eligibility Listing, Webinars and Training

Curriculum Development:

MUREP Innovations in Space Technology Curriculum (MISTC)

Indigenous Connections and Engagement:

MUREP for American Indian and Alaska Native STEM Engagement (MAIANSE)

Digital Badging:

MUREP Educator Professional Development (EPDC)



PARTNERSHIPS & SUSTAINABILITY

Internal & External Collaboration:

- ❖ MUREP INCLUDES – NSF
- ❖ MUREP Partnering to Advance Capacity and Technology (MPACT) Pilot
- ❖ MUREP Small Business Technology Transfer Research (M-STTR) - STMD



STUDENT ENGAGEMENT

Pre-College STEM Learning Experiences:

- ❖ MUREP Aerospace Academy (MAA)
- ❖ Upward Bound

Higher Education STEM Learning Experiences:

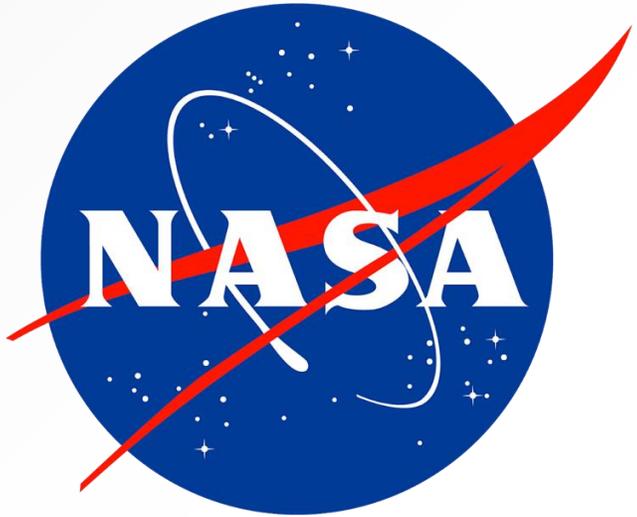
- ❖ NASA Community College Aerospace Scholars (NCAS)
- ❖ MUREP Funded Internships & Fellowships

Challenges and Competitions:

- ❖ First Nations Launch (FNL)
- ❖ MUREP Innovation and Tech Transfer Idea Competition (MITTIC)
- ❖ NASA MUREP Innovative New Designs for Space (NASA MINDS)

Awareness Events:

- ❖ NASA Days / STEM Conferences



FY21 – 22 MUREP and NASA Mission Directorate Engagement



FY21 – 22 MUREP Engagement

Aeronautics & Space Technology

MUREP High Volume Manufacturing Supply Chain Management Cooperative (HighVolume)



Partnership w/ NASA ARMD to increase diversity in Aeronautics

Identify solutions to U.S. supply chain concerns for drone parts and repair

3 active awards

New Solicitation – August 2021

MUREP Space Technology Artemis Research (M-STAR)



Enhancing capabilities of MSIs to participate in Space Technology opportunities

Planning Grants awarded to 15 MSIs (August 2020)

New Implementation Grant:
Up to \$250k per year / maximum two years

Closed – May 10th Awards in Summer 2021

MUREP Small Business Technology Transfer Research (M-STTR)



SBIR · STTR
America's Seed Fund™
POWERED BY NASA

Broadening participation of MSIs in STTR

Increasing MSI competitiveness to respond to STTR Topics

New Planning Grant Opportunity:
8-10 Planning Grants
Up to \$30k to \$50k each

Closed – June 11th Awards in Summer 2021

NASA Road Tour



MSI Engagement to showcase STTR opportunities

NASA Mission Directorates, Prime Contractors, Small Business & Office of Procurement connect w/ MSI leaders

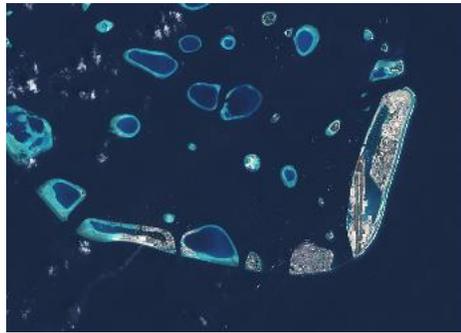
Next Road Tour – November 2021 at San Jose State (Tentative)





FY21 – 22 MUREP Engagement Earth Sciences

MUREP Ocean Biology and Biogeochemistry (OCEAN)



Building capacity at MSIs to participate in NASA's SMD / Earth Science research opportunities.

New Funding Opportunity:
Up to \$250k per year, ~8 awards maximum 3 years

Step I: Proposals Due Dec 18th
Step II: Proposals Due Apr 15th
Awards in Summer 2021

Ground Based Measurement Networks for MSI Engagement



Introduction of MSIs to Instrument Monitoring

Development of pathways for diverse ESD future workforce

RFI – to be released
Schedule - TBA

Full Proposals via ROSES

Global Learning & Observations to Benefit the Environment (GLOBE)



Engaging students & the public in hands-on science.

DEI Tasks Force Action Plan – Presented in July 2020

DEI Educational resources / webinar series for students.

Digital accessibility training for GLOBE Community & Teachers.

Visit GLOBE's new DEI Blog:
<https://www.globe.gov/globe-community/people/dei-task-force>

MSI Exchange



MSI Database

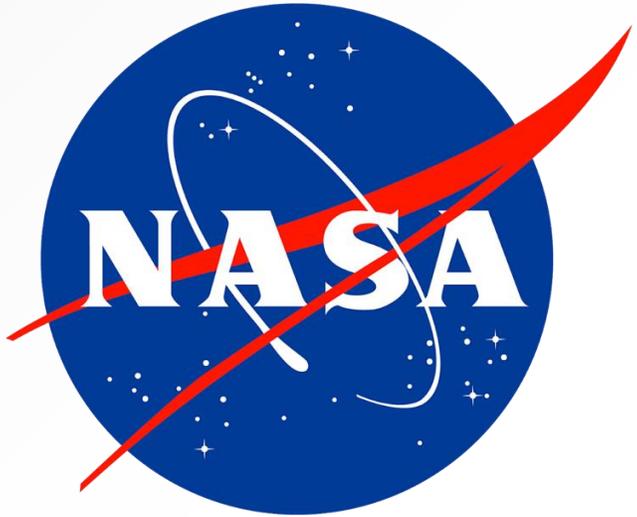
Externally available

Supports online search for:

- Diverse academic collaborators
- MSI STEM Programs
- Research Capabilities

<https://msiexchange.nasa.gov>





MUREP Leveraging Technology to Drive Participation



Minority Serving Institutions (MSI) Exchange

The MSI Exchange is a resource that drives collaboration to build capacity and competitiveness of MSIs. The MSI Exchange was designed to meet the needs of NASA missions and has application across public and private sectors.

NASA Mission Directorates

Federal Researchers

NASA Primes & Small Businesses

Minority-Serving & Majority Institutions

Benefits

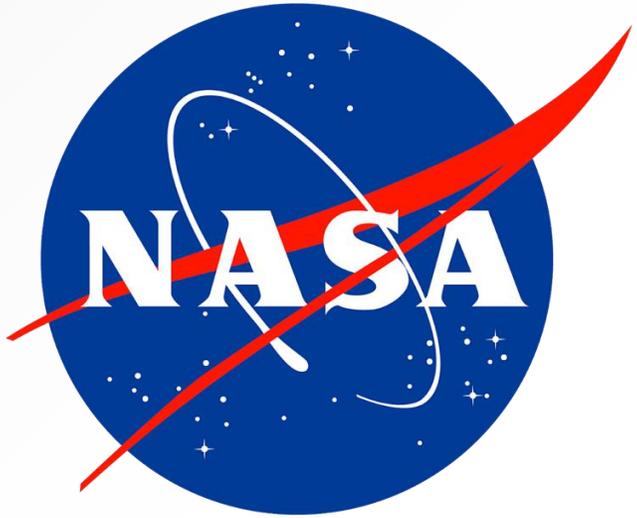
- ✓ Provides MSI awareness and connectivity.
- ✓ Powers the search for diverse academic collaborators by amplifying the applied research and areas of expertise of MSIs.
- ✓ Informs partnerships for teaming opportunities and competitive federal awards such as grants, contracts and cooperative agreements.
- ✓ Increases MSI faculty and student involvement in NASA research.
- ✓ Increases the diversity and capabilities of NASA's future STEM workforce.



Features

- STEM Profiles
- Capability Statements
- Official NASA MSI List
- MSI Distribution List
- Advanced Sort and Filter Options
- Training + Professional Development

<https://MSIExchange.nasa.gov/>



MUREP COMPETITIVENESS STRATEGY

NASA HBCU COMPETITIVENESS STRATEGY FRAMEWORK

NASA's Mission is to lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and bring new knowledge and opportunities back to Earth, and to support growth of the Nation's economy in space and aeronautics, increase understanding of the universe and our place in it, work with industry to improve America's aerospace technologies, and advance American leadership.

AGENCY GOALS

Discover references NASA's enduring purpose of scientific discovery by expanding human knowledge through new scientific discoveries.

Explore references NASA's push to expand the boundaries of human presence in space by extending human presence deeper into space and to the moon for sustainable long-term exploration and utilization.

Develop references NASA's broad mandate to promote the technologies of tomorrow by addressing national challenges and catalyzing economic growth.

Enable references the capabilities, workforce, and facilities that allow NASA to achieve its mission through optimizing capabilities and operations.

HBCU GOALS

Goal 1: Increase the capacity of HBCUs to compete for and receive agency funding and other financial resources.

Goal 2: Increase the amount of funds awarded to HBCUs through competitive grants, contracts and cooperative agreements.

Goal 3: Increase the recruitment/applicant pool of HBCU students and graduates for STEM Engagement and future workforce opportunities.

Goal 4: Increase the representation / selection of HBCU students in agency sponsored programs.

HBCU Metrics

Metric 1: Aim to increase the overall agency funding to HBCUs by 10% by end of FY2022; Aim to maintain a minimum of 20% of funding to HBCUs through the Minority University Research and Education Project (MUREP) by end of FY2022.

Metric 2: Aim to increase the number of eligible proposals submitted by HBCUs by 10% by end of FY2022.

Metric 3: Aim to increase the number and percentage of applicants from HBCUs for Internships, Fellowships, Pathways and Permanent hiring opportunities by end of FY2022.

Metric 4: Aim to achieve a 25% increase in internship placement for HBCU students by end of FY2022.

Strategies

Strategy 1: Provide resources to HBCUs to train faculty and administrators for better understanding of proposal preparation, merit review process, and award administration policies and procedures ; broaden pool of qualified reviewers to participate in merit review process.

Strategy 2: Drive awareness, inclusion and selection of HBCUs through grants, cooperative agreements and contracts; foster awareness of HBCU research capabilities and notify HBCUs of agency funding opportunities and resources.

Strategy 3: Identify opportunities that attract and target candidates of diverse backgrounds while promoting NASA's workforce inclusion.

Strategy 4: provide internships, fellowships, and other experiences for HBCU students to conduct scientific and technical research and perform design and development activities to fulfill NASA needs and priorities. NASA will create challenges, competitions and other transdisciplinary experiential learning opportunities to enhance STEM student studies.

Tactics

- NASA Solicitation and Proposal Integrated Review System (NSPIRES) and Grants.gov
- [Minority Serving Institution \(MSI\) Gateway](#)
- NASA Technology Infusion Road Tour
- Small Business Technology Transfer (STTR)
- Procurement and Federal Contracts
- Equal Opportunity and Diversity and Inclusion in STEM
- Funded Internship and Fellowships
- Recruitment / NASA Days and Career Fairs

Mission Directorate Engagement

Drive competitiveness to increase MSI participation in NASA Mission Directorate (MD) opportunities.

- Understanding MD opportunities
- MD participation in trainings and workshops
- Early stage funding from MDs



Agency 1% MSI Prime / Subcontracting Goal

Drive competitiveness to increase MSI participation in NASA federal contracts.

- Federal Contracts Training
- Understanding NASA Contracts Requirements
- Connecting with NASA small business specialists

EXPLORE PROCUREMENT



Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)

Drive competitiveness to increase MSI participation in SBIR/STTR opportunities.

- Increase access to small business enterprises
- Support proposal development
- Provide topics more relevant to MSIs



Training / Partnerships

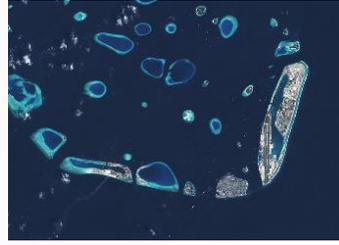
Drive competitiveness to strengthen MSI responses to NASA opportunities.

- Standardize information levels & Best Practices
- Developing Collaborations
- Understanding Request for Proposals



Mission Directorate Engagement

Drive competitiveness to increase MSI participation in NASA Mission Directorate (MD) opportunities.



Agency 1% MSI Prime / Subcontracting Goal

Drive competitiveness to increase MSI participation in NASA federal contracts.

**NASA HBCU/MSI Technology Infusion
Road Tour at San Jose State University
November 2021**

EXPLORE PROCUREMENT



Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)

Drive competitiveness to increase MSI participation in SBIR/STTR opportunities.



SBIR · STTR
America's Seed Fund™
POWERED BY NASA

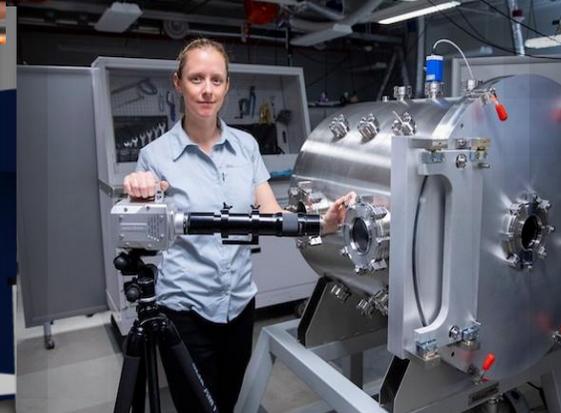
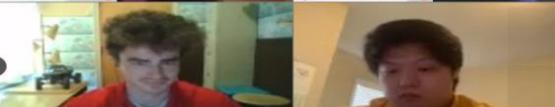
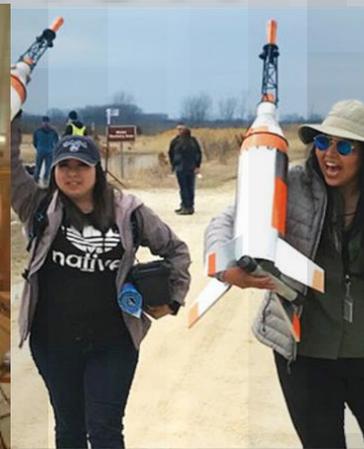
Training / Partnerships

Drive competitiveness to strengthen MSI responses to NASA opportunities.





MUREP IN ACTION

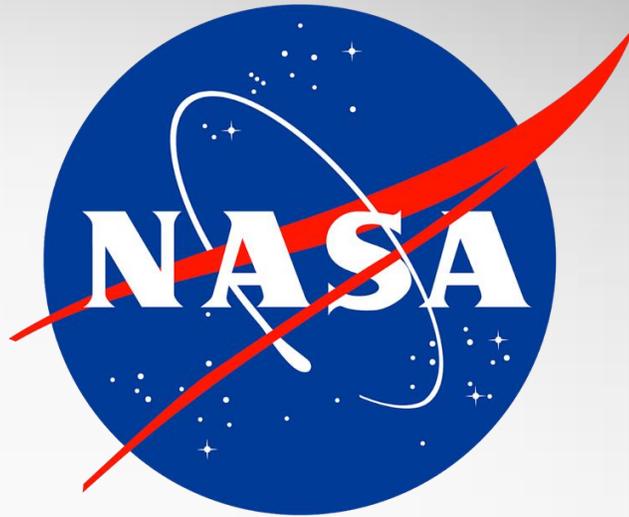


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Questions?



FOR ADDITIONAL INFORMATION AND UPDATES, VISIT THE
MUREP WEBSITE:

WWW.NASA.GOV/STEM/MUREP

FOR QUESTIONS OR FEEDBACK, CONTACT US:

HQ-MUREP@MAIL.NASA.GOV